

Smoking Habits Among Multiphasic Examinees, 1979 to 1984

GARY D. FRIEDMAN, MD, MS; STEPHEN SIDNEY, MD, MPH, and
MICHAEL R. POLEN, MA, Oakland, California

In tabulating the smoking habits of 95,744 residents of the San Francisco Bay Area, as reported between July 1979 and June 1984 at multiphasic health checkups, the prevalence of current smoking was found to be higher in men than in women aged 30 years and above, but in those younger than 30 the reverse was true. In every age group, compared with male smokers, female smokers tended to smoke fewer cigarettes per day, to inhale less and to smoke cigarettes with lower tar and nicotine yield. Blacks showed the highest percentage of smokers, whites were second highest and Asians were lowest, with Asian women being substantially lower than other race-sex groups. On average, white smokers smoked more cigarettes per day and inhaled more than did black smokers, but whites were more apt to smoke low-yield cigarettes. Compared with a 1964 to 1968 study in the same setting, there has been a decrease in the prevalence of cigarette smokers but, among smokers, a higher proportion in 1979 to 1984 smoked at least 20 cigarettes per day. During the 1979 to 1984 period, there were small downward trends in the prevalence of cigarette smoking in men and white women and in the prevalence of heavy smoking among male smokers, but there was no apparent increase in the use of lower-yield cigarettes by smokers. Although this study group contained relatively fewer smokers, most of the age, sex and racial differences and long-term trends parallel what has been observed nationally.

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Since July 1979, we have been conducting a prospective cohort study to determine the health effects of smoking low-yield cigarettes. Persons enter the study when they complete a detailed questionnaire about their smoking habits. This questionnaire is self-administered on a voluntary basis during multiphasic health checkups. Because the study group is large and heterogeneous with respect to ethnicity and socioeconomic status, we tabulated its responses regarding smoking habits as an indication of recent trends in smoking practices among blacks and whites in the San Francisco Bay Area.

Methods

An automated multiphasic health checkup (MHC) has been offered since 1964 to about 25,000 persons per year at each of two medical centers of the Kaiser Permanente Medical Care Program, one in Oakland and one in San Francisco.¹ The characteristics and correlates of the smoking habits

among the program's subscribers who undergo these examinations have been studied extensively.²⁻⁷ In general, the subscribers of this health maintenance organization come from almost all walks of life. Those who take these MHCs are also heterogeneous but, like others who desire health examinations, they tend to be better educated and more health-conscious.^{2,8,9}

Starting in July 1979, examinees were asked to complete a supplementary questionnaire that explored their smoking habits in detail (shown, in part, in Figure 1). The tar yield was obtained from 1978 Federal Trade Commission estimates for each brand and type of cigarette.¹⁰ Altogether 95,744 or 86.2% of the 111,104 examinees during the July 1979 to June 1984 study period completed this questionnaire. In mid-1980 the MHC was discontinued at the San Francisco facility. Findings regarding smoking habits refer to the entire study population, except that examination of time trends within the

From the Division of Research, Kaiser Permanente Medical Care Program, Oakland, California.

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Reprint requests to Gary D. Friedman, MD, The Permanente Medical Group, Inc, Division of Research, 3451 Piedmont Ave, Oakland, CA 94611.

five-year period was restricted to subjects examined in Oakland. When subjects had more than one MHC, only the first was included in this analysis. All age adjustments were made with the direct method, with the age distribution of the entire study population used as the standard. Because the number of persons aged 80 years and over was small, they were excluded from the age-adjusted rates.

Results

Overall Smoking Habits

Among the men, the prevalence of current cigarette smoking rose from 19.8% in the 15- to 19-year age group to a peak of 32.0% in the 30- to 39-year-olds and a similar prevalence of 31.8% in the 40- to 49-year-olds (Table 1). Then there was a subsequent decrease with age to the low of only

If you have **never** used any tobacco product (cigarettes, cigars, tobacco pipe, chewing tobacco, snuff), check box below and then skip to questions 41-52.

1 ☐ Never used any tobacco product

If you have **ever** used any tobacco product (cigarettes, cigars, tobacco pipe, chewing tobacco, snuff), answer questions below, **then** answer questions 41-52.

1. Have you ever smoked cigarettes regularly for at least one year? (Here "regularly" means at least 5 cigarettes per week, almost every week)

1 ☐ Yes If Yes, answer questions 2-19 below.
2 ☐ No If No, skip to question 20.

3. Do you still smoke cigarettes regularly?

1 ☐ Yes
2 ☐ No, but I still smoke cigarettes occasionally
3 ☐ No, not at all

7. How many cigarettes do you smoke per day, on the average? Or, if you have stopped smoking regularly, how many did you smoke, on the average, before you stopped? (1 pack = 20 cigarettes)

_____ cigarettes per day

8. What brand of cigarette do you usually smoke? Or, if you have stopped smoking, what brand did you smoke most recently? _____

Are (were) these:		Are (were) these:		Are (were) these:
1 <input type="checkbox"/> filtered	➡	1 <input type="checkbox"/> regular length (85mm)	➡	1 <input type="checkbox"/> mentholated
2 <input type="checkbox"/> unfiltered		2 <input type="checkbox"/> king-size (100 mm)		2 <input type="checkbox"/> plain
		3 <input type="checkbox"/> long		

14. When you smoke, how often do you inhale the smoke? Or, if you have stopped smoking, how often did you inhale the smoke before you stopped?

Check only one

1 ☐ All the time, each puff
2 ☐ Most of the time
3 ☐ Part of the time
4 ☐ Rarely
5 ☐ Never inhale

20. Have you ever smoked cigars regularly for at least one year? (Here "regularly" means at least two cigars per week, almost every week)

1 ☐ Yes If Yes, answer questions 21-30 below.
2 ☐ No If No, skip to question 31.

22. Do you still smoke cigars regularly?

1 ☐ Yes
2 ☐ No, but I still smoke cigars occasionally
3 ☐ No, not at all

31. Have you ever smoked a tobacco pipe regularly for at least one year? (Here "regularly" means at least two pipefuls of tobacco a week, almost every week)

1 ☐ Yes If Yes, answer questions 32-39 below.
2 ☐ No If No, skip to question 40.

33. Do you still smoke a pipe regularly?

1 ☐ Yes
2 ☐ No

Figure 1.—Depicted are items from the 1979 to 1984 tobacco questionnaire used for this study, selected and reproduced from a 52-item questionnaire used in an automated multiphasic health checkup.

8.5% among those aged 80 and over. Former smoking rose with age to a peak of 38.4% among 60- to 69-year-olds with a slight decline thereafter. The age trends for never smoked cigarettes and never smoked anything were similar to each other and were U-shaped, with the lowest prevalence in the 50- to 59-year group. Current cigar and pipe smoking were infrequent. The maximum age-specific prevalences were 3.5% for cigars among those aged 50 to 59 years and 3.8% for a pipe among those aged 60 to 69 years.

Among women, current cigarette smoking was also most prevalent in 30- to 39-year-old persons (30.0%), but all age groups from 15 through 49 years had about the same proportion of current smokers. This was followed by a pronounced decline with age to a low of 5.5% among those aged 80 and over. Cigarette smoking was more frequent in men than in women at all ages above 30 years but the opposite was true below age 30. As in the men, the age curve for former smoking was an inverted U shape with a maximum prevalence in the 60- to 69-year group. The prevalence of former smoking, however, was much higher in men than in women except below age 30, where men and women were quite similar. There was a considerably higher proportion of those who never smoked among the women at all ages above 30 years, the difference increasing with advancing age. In the 15- to 19-year age group, never having smoked was more common among men than women. Prevalences of cigar and pipe smoking among women are not shown in Table 1, as there were only 44 (0.1%) women who reported current cigar smoking and 21 (0.04%) who reported pipe smoking.

Racial Differences

Among both men and women, blacks showed the highest prevalence of current smoking (Table 2). The men of other and unknown race were second highest, whites third highest and Asians lowest with a prevalence of 61% of that of blacks. Among women, whites had the second highest prevalence and those of other and unknown race had the third highest. Asian

women had a strikingly lower prevalence, only 30% of that of blacks. The within-race age patterns of current cigarette smoking were generally similar to those shown in Table 1 for all subjects combined. Deviations were found usually in groups where the numbers were small and the proportions therefore statistically unreliable.

More detailed breakdowns of smoking habits, to follow, were done only on all racial groups combined and on the two largest racial groups, blacks and whites.

Quantity Smoked

Overall the percentages of cigarette smokers who smoked at least 20 cigarettes per day (Table 3) peaked in the 50- to 59-year age group among the men and the 40- to 49-year age group among the women, with the 40- to 69-year groups all being close to peak, especially among the women. White cigarette smokers smoked considerably more cigarettes per day than blacks, on average, in every age group and among both sexes.

Inhaling

The questionnaire item on inhaling allowed respondents to choose among inhaling all the time, most of the time, part of the time, rarely or never (Table 4). The relative frequency of at least partially inhaling started at close to 100% in youth and gradually decreased with age. White men tended to exceed black men in reported inhaling only slightly in this tabulation. This racial difference, however, was more striking in a finer breakdown of inhalation categories in which 58.4% of all white men reported inhaling all of the time as compared with 45.3% of black men (age adjusted). Except for women in their 70s, the excess of inhaling in whites over blacks was somewhat greater in women than in men. Also, 52.1% of white women inhaled all the time as compared with 39.3% of black women (age adjusted).

Cigarette Yield

Based on the reported brand and type of cigarette usually smoked, smokers were classified as smoking cigarettes of

TABLE 1.—Prevalence of Cigarette, Cigar and Pipe Smoking by Age and Sex in the Total 1979 to 1984 Study Population*

	Age, Years								
	15-19	20-29	30-39	40-49	50-59	60-69	70-79	80+	Total
Men									
Total number	1,076	8,047	11,694	7,576	6,713	4,963	1,587	223	41,879
Never smoked, %	75.4	59.1	42.8	35.2	31.2	33.2	39.9	48.9	42.3
Smokes cigarettes									
Never, %	75.8	60.0	45.4	38.8	36.2	39.2	47.4	55.2	45.7
Former, %	4.0	11.6	21.7	28.6	34.0	38.4	37.2	34.1	25.2
Current, %	19.8	27.7	32.0	31.8	28.7	21.1	14.0	8.5	28.2
Unknown, %	0.4	0.7	0.9	0.8	1.1	1.3	1.4	2.2	0.9
Currently cigar, %	0.1	0.7	1.4	2.3	3.5	3.2	3.1	0.0	2.0
Currently pipe, %	0.1	0.6	1.9	2.7	3.2	3.8	3.0	0.0	1.7
Women									
Total number	1,851	12,519	14,107	8,620	8,325	5,881	2,160	402	53,865
Never smoked, %	65.4	59.3	53.2	51.3	54.6	57.8	71.2	86.1	56.4
Smokes cigarettes									
Never, %	65.5	59.4	53.3	51.4	54.7	58.0	71.3	86.1	56.5
Former, %	4.8	10.6	16.2	18.5	18.5	20.4	16.4	8.2	15.6
Current, %	29.0	29.6	30.0	29.5	26.0	20.9	11.6	5.5	27.3
Unknown, %	0.7	0.4	0.5	0.6	0.8	0.7	0.7	0.2	0.6

*Cigarette, cigar and pipe smoking are tabulated independently without regard to one another.

either low yield (<15 mg tar), high yield (\geq 15 mg tar) or unknown yield, the last accounting for about 14% of smokers and varying little by sex and race (Table 5). Blacks were clearly less apt to smoke low-yield cigarettes than whites, and, except for blacks aged 15 to 19 years, men were less apt to smoke low-yield cigarettes than women. Except for some wide discrepancies in the few and therefore statistically unreliable 15 to 19 year-olds, there was little variation in preference for low-yield cigarettes by age.

Time Trends, 1979 to 1984

There were only small changes in the prevalence of cigarette smoking noted from year to year. Among white men the age-adjusted percentage of smokers was 26.5% in 1979 to 1980, 26.9% in 1980 to 1981, 25.6% in 1981 to 1982, 24.9% in 1982 to 1983 and 23.0% in 1983 to 1984. Among white women the corresponding percentages were 27.9%, 28.7%, 27.7%, 27.7% and 25.9%. Among black men they

were 39.3%, 38.9%, 39.3%, 38.4% and 37.2%. Only the black women did not show a lower percentage of smokers at the end than at the beginning of the five-year period, but the increase was minimal; their corresponding percentages were 34.1%, 36.5%, 33.3%, 35.8% and 34.2%.

Among white male smokers, the number smoking at least 20 cigarettes a day declined slightly over the five years, the successive annual age-adjusted percentages being 68.5%, 68.9%, 68.2%, 65.1% and 63.5%. White women showed no such change, the percentages being 56.0%, 56.3%, 57.8%, 53.4% and 56.1%, respectively. Black male smokers showed a slightly irregular decline as did white men; the respective percentages smoking at least 20 cigarettes per day were 48.4%, 48.6%, 48.9%, 43.7% and 44.5%. No clear trend was apparent in the black female smokers whose annual age-adjusted percentages of smoking at least 20 cigarettes a day were 34.9%, 34.7%, 38.3%, 38.6% and 33.8%.

The use of low-yield cigarettes showed some year-to-year variation but no clear time trends in any of the four race-sex groups.

In summary, there were some small downward five-year trends noted in the prevalence of cigarette smoking in white men and women and in black men and in the prevalence of heavy smoking among male smokers of both races. No increase in smokers' use of low-yield cigarettes was apparent.

Comparison With 1964 to 1968 Data

Smoking habits of MHC examinees were extensively studied during the 1964 to 1968 period.² The questionnaires used and methods of classifying smokers were different at that time. To approximate as closely as possible our present classi-

TABLE 2.—Age-Adjusted Prevalence of Current Smoking by Sex and Race

Sex	Race	Total Number, Age < 80 Yr	Current Cigarette Smokers: Age-Adjusted Percentage*
Male	Asian†	4,511	23.0
	Black	9,598	37.9
	White	24,536	25.7
	Other and unknown	3,011	30.0
Female	Asian†	5,936	10.4
	Black	15,445	34.2
	White	28,236	27.6
	Other and unknown	3,846	25.8

*Adjusted by direct method with entire study population as standard; persons aged 80 years and over excluded.

†The Asians reported that they were in the following subgroups: Chinese descent, 44.9%; Filipino descent, 32.3%; Japanese descent, 13.4%; other Asian, 9.4%.

TABLE 3.—Percentages of Cigarette Smokers Who Smoked 20 or More Cigarettes Per Day

Sex	Race	Age, Years						
		15-19 %	20-29 %	30-39 %	40-49 %	50-59 %	60-69 %	70-79 %
Male	All	26.3	45.4	57.1	63.5	65.3	62.4	49.5
	Black	14.7	33.2	49.1	58.5	54.0	48.0	23.1
	White	37.0	57.7	66.1	70.7	75.5	70.3	55.1
Female	All	19.8	34.7	47.4	51.8	51.2	51.6	41.8
	Black	9.5	24.6	42.4	42.5	36.2	31.1	26.9
	White	32.6	47.2	54.6	62.1	61.6	58.4	44.8

TABLE 4.—Percentages of Cigarette Smokers Who Inhaled at Least Part of the Time

Sex	Race	Age, Years						
		15-19 %	20-29 %	30-39 %	40-49 %	50-59 %	60-69 %	70-79 %
Male	All	97.2	95.1	94.2	91.3	87.2	80.4	73.9
	Black	100.0	95.8	94.7	91.9	85.3	77.5	76.9
	White	96.7	96.7	96.5	94.1	90.5	84.5	77.8
Female	All	95.9	94.9	92.5	86.3	79.4	69.2	57.0
	Black	96.4	94.8	90.8	81.9	72.4	59.1	61.5
	White	97.7	96.3	95.1	92.6	85.2	73.7	57.1

TABLE 5.—Percentages of Cigarette Smokers Who Smoked Low-Yield (<15 mg Tar) Cigarettes

Sex	Race	Age, Years						
		15-19 %	20-29 %	30-39 %	40-49 %	50-59 %	60-69 %	70-79 %
Male	All	14.6	22.7	23.5	20.1	19.2	22.8	22.5
	Black	14.7	12.8	15.9	15.1	13.0	14.2	10.3
	White	16.3	30.7	29.6	24.6	24.0	26.4	25.9
Female	All	16.8	28.7	29.2	25.9	28.0	30.8	30.7
	Black	9.6	17.5	20.2	16.4	19.3	21.7	11.5
	White	22.5	40.9	37.2	33.7	34.6	34.2	33.5

TABLE 6.—Percentage of Study Population Who Were Current Smokers and Percentage of Current Smokers Who Smoke at Least 1 Pack or 20 Cigarettes Per Day in the 1964 to 1968 (Oakland Only) Data Base and the 1979 to 1984 Data Base*

	% Current Smokers		% of Current Smokers Who Smoke at Least 20 Cigarettes Per Day	
	1964-1968	1979-1984	1964-1968	1979-1984
Males				
White	41.7	25.7	62.3	66.9
Black	51.6	37.9	40.0	47.9
Females				
White	38.9	27.6	49.5	56.1
Black	40.6	34.2	31.8	35.6

*All percentages are age-adjusted by the direct method to the same 1979 to 1984 standard. Persons with no or unknown response in the 1964 to 1968 data were excluded. Unknowns comprised less than 1% of the 1979 to 1984 data and were not excluded.

fication of current cigarette smokers, we looked at responses to the single 1964 to 1968 question, "During the past year did you smoke cigarettes?" We also looked only at persons examined then in Oakland because the vast majority of our combined 1979 to 1984 data was gathered in Oakland. There has been a sizable drop in the percentage of current smokers, both white and black and both male and female, over the (approximately) 15-year interval. Among smokers, however, the percentage who smoke at least one pack of cigarettes per day has increased (Table 6).

Discussion

Although not a representative sample of the San Francisco Bay Area population, our study group was large and heterogeneous and they were asked about smoking habits in a non-judgmental health care setting; they were also comparable to a group whose smoking habits were assessed in detail during the 1964 to 1968 period.² Thus their reported habits are of interest to those who are concerned with recent trends and current smoking habits in this large US metropolitan area.

Overall, men showed only a slightly higher percentage of smokers than women and the male excess was present only in the age decades over 30 years. Of concern for the health of women in the future is the fact that under age 30, the percentage of female smokers recently exceeded that of men. In every age group, however, female smokers tended to smoke fewer cigarettes per day, and inhalation was less common in women, especially in the older age groups. Furthermore, women more often smoked low-yield cigarettes than men.

Racial differences in the prevalence of smokers were more striking than sex differences. Among the three largest racial groups, blacks showed the highest percentage of smokers, whites were second highest and Asians lowest with Asian women being substantially lower than other race-sex groups. The recent special public health efforts to decrease cigarette smoking among blacks, including a community-based project recently mounted by our department in Richmond, California, seem well justified by the racial differences here noted.

Interestingly, however, although more blacks smoke, blacks do not necessarily smoke more intensively than whites. We found that white smokers smoked more cigarettes per day on average and reported more inhaling of cigarette smoke than did black smokers. Blacks, however, were less apt to smoke low-yield cigarettes than whites.

As expected in a relatively health-conscious group receiving health examinations, our study group had a lower overall prevalence of cigarette smoking than the US population as a whole in 1980 and 1983^{11,12}—about 5 to 10 percentage points lower in men and about 2 to 5 percentage points lower in women, depending on the age group considered. Our data, however, resemble national data with respect to male-female and black-white differences and to age trends in smoking habits. Nationally, men had a higher prevalence of smoking than women at all ages except 20 to 24 years, where women were slightly higher. Men smoked more cigarettes per day than women, and the heaviest smokers tended to be persons in the 40s and 50s. As in our study group, black men had the highest prevalence of smoking and white men had the second highest. Among women nationally (in 1980), there were only slight differences in smoking prevalence between

blacks and whites, but by 1983 black women were nearly 10% more likely to be smokers than white women. In our study group, black women were nearly 25% more likely to be smokers than white women. Nationally as well as in our study population, both black men and black women were less likely to be heavy smokers than were white men and white women, respectively.

National data on the overall use of lower-yield cigarettes¹³ were not readily comparable with our own. With respect to male-female and black-white differences and age trends, however, the 1979 to 1984 MHC population was similar to the US population in 1979¹³; low-yield cigarettes were used proportionately more often by women than by men and by whites than by blacks, but their use was not related to age. White men and white women were each about twice as likely to smoke low-yield cigarettes as black men and black women, respectively, both nationally and in our study group.

Although data from 1964 to 1968 and 1979 to 1984 were not strictly comparable, they are sufficiently similar to permit confidence that fewer of our MHC examinees smoked recently than during the earlier period, but that among the smokers, more are heavy smokers during the recent period. The latter is probably due to several causes, but one likely factor is that it is easier for those who smoke less to quit.¹⁴ Thus, all of the health warnings concerning smoking that have been publicized since the 1964 Surgeon General's report seem to have had the greatest effect on those who smoke less. We did not collect cigarette yield data in 1964 to 1968, so the trend toward the use of low-yield cigarettes observed elsewhere cannot be evaluated in these data. Based on national sales data, however, the use of low-yield cigarettes was probably infrequent in the 1960s.¹⁵

During the five-year 1979 to 1984 period, changes in smoking habits were modest. There were small downward trends in the prevalence of cigarette smoking in men and white women and in the prevalence of heavy smoking among smoking men, but no overall reduction in the yield of the cigarettes smoked was apparent. The heavy marketing of low-yield cigarettes seems to have had little effect on our study group during the period.

National trends from the mid-1960s to the early 1980s in the prevalence and amount of smoking¹¹ are generally similar to those found in our population of MHC examinees: the prevalence of smoking declined, but smokers tended to smoke more cigarettes per day. The declines in smoking prevalence nationally were greater among men than women, slightly greater among white men than among black men and much greater among white women than among black women. Smoking declined most among white men and least among black women both nationally and in the MHC population. Between 1980 and 1983 nationally (for all races combined), declines in heavy smoking were greater among women than among men. In contrast, our study group showed a slight decline among men but not among women between 1979 and 1984. This inconsistency could reflect differences in the definition of heavy smoking (20 or more cigarettes per day in our study versus 25 or more in the national data) or in the time periods considered.

In conclusion, our data indicate some favorable trends in smoking habits since the mid-1960s, particularly a decrease in the proportion of examinees who smoke cigarettes. Not all

indices of smoking intensity declined, however, and even in this relatively health-conscious population in recent years, slightly more than a fourth of persons were current cigarette smokers. Thus, from a public health point of view, much still needs to be done to discourage smoking. Of particular concern are blacks, more of whom smoke than of other racial groups, young women, who have overtaken young men in smoking prevalence, and the tendency of smokers to smoke more cigarettes, on average, in recent years than in the mid-1960s.

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